

Saturday



Magazine.

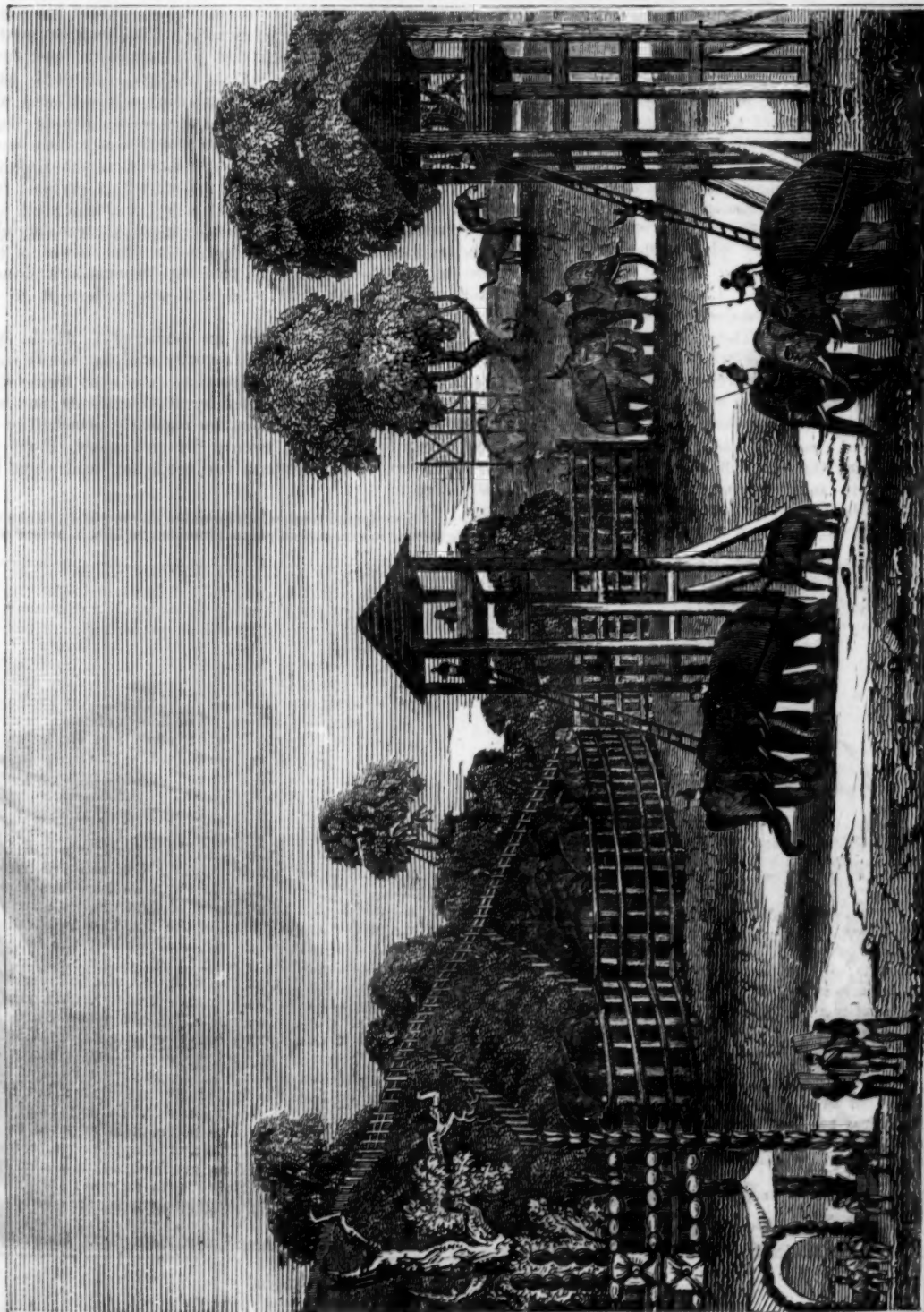
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UNDER THE DIRECTION OF THE COMMITTEE OF GENERAL LITERATURE AND EDUCATION,
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METHOD OF CATCHING WILD ELEPHANTS IN CEYLON.

THE NATURAL AND CIVIL HISTORY OF CEYLON.

IV. MANNER OF CATCHING ELEPHANTS—KNOX'S ACCOUNT OF THE ELEPHANT.

THE manner of catching wild elephants is very simple, though attended with much labour and expense. As soon as it has been well ascertained where the herds have congregated, the forest is surrounded with fires kindled at certain distances, and forming a circuit of at least thirty miles. These are kept continually burning, and the intervals occupied by men, to the number of several thousands. The fires are raised four feet from the ground upon moveable stands, formed of four perpendicular sticks with twigs wattled across on the top, upon which earth is laid to receive the fuel, and covered with a sloping canopy of cocoa-nut leaves to protect it from the rain. These stands are placed, at first, about seventy yards asunder, and are brought nearer by degrees, in proportion as the circle is diminished, which is gradually done every day, until the elephants are confined within so narrow a circle, that the intervals between the fires do not exceed twenty feet. The circle is daily narrowed, at the average rate of about a quarter of a mile. As the space diminishes, the enclosed elephants become eager to escape, and it requires great vigilance and management, to prevent them from forcing their way through the intervals; but they have so great a dread of fire, that this is in general very successfully done: for the shouts and flames strike them with so much terror, that if they venture on a charge, they are soon compelled to retreat, provided the hunters are cool and resolute.

The herd is finally enclosed within a very confined circle; one part of which is elongated like the mouth of a funnel, and the extreme end just spacious enough to admit a single elephant. The elephants are now confined to a space so narrow, that their power of action is considerably impeded; the enclosure being reduced to a compass of little more than a mile, and still surrounded by fires. Within this fiery circle is a palisade, composed of large, strong stakes, connected by transverse beams, and further secured by powerful supporters, forming a fence of prodigious strength and compactness. Fresh boughs are strewed before the snare, in order to conceal it from the elephants, which, mistaking the boughs for the natural forest, seldom attempt to assault the fence; but when they do, it is always attended with extreme danger. That part of the snare in which the elephants are first enclosed, is, as I have before said, about a mile in circumference, but it communicates with a smaller one, not more than a hundred feet long, and forty wide, through which passes a rivulet five feet deep, nearly filling the whole inner space. The elephants enter the last enclosure at only one gate, and beyond the water the fence gradually contracts, terminating in a small passage, as already mentioned, about a hundred feet long by five broad. This latter enclosure is composed of the trunks of trees nearly a foot in diameter, sunk six feet into the ground, and forming a gigantic fence about twenty feet high. The trees are bent inward to a considerable curve, being little more than a foot apart, and crossed by four rows of immense beams, strapped to them with thick strips of bamboo. To this palisade, are added supporters still more inclined, and several feet asunder, thus greatly increasing the security of the snare. In spite, however, of its vast strength, and the skill employed by the huntsmen, the elephants have been known, after two or three desperate charges, to break it down, and effect their escape; though this rarely happens.

As soon as the devoted herd is driven within the larger circle, the entrances are secured by immense stakes, strengthened with transverse beams, like the rest of the fence. Fires are then kindled within, in order to drive them into the smaller fold, in which, if their numbers are great, they are so crowded, that they have little or no power to exert their prodigious energies. The persons who manage the fires, can easily escape through the interstices between the pales, should the elephants attempt to rush upon them.

The gate of the inner fold is composed of round poles, placed horizontally, and fastened together with strong withies and thick ropes, and is rolled up like a scene in a theatre. Several men sit upon the cross-beam at the top, to which it is suspended, ready to cut the cords upon a given signal. When the fires and terrifying shouts of the

hunters have frightened a sufficient number of elephants into this narrow enclosure, the cords of the pliable door are cut, and it drops down, thus cutting off their retreat, and they are generally so thronged together, that they have scarcely power to move; thus, the entrance is a sufficient security against their efforts to escape. Their attempts, too, are almost always foiled by the spearmen, who prick their trunks, which are very sensitive, the moment they approach the entrance of the barrier. Seeing now no chance of egress, but through the narrow passage before spoken of, which terminates like a funnel, the nearest elephant enters, and rushes to the end, in hope of escaping, when it finds itself stopped by an impassable barrier. As soon as the deluded captive has arrived at the end of the long passage, and perceives that there is no egress, as the strait is too narrow to admit of returning, it attempts a retrograde movement, but its purpose is anticipated by bars being drawn across through the interstices of the stakes; and it is thus secured in immovable confinement. Its legs are now tied, and a strong cord apparatus is fastened round its neck. It frequently happens, that the prisoner makes prodigious efforts to regain its liberty, rearing upon its hind-legs, and making the most frightful exertions to break down the barrier; but the enraged animal is repelled from above by the hunters, who strike it on the head and trunk with their spears, and thus generally subdue its violence.

When the elephant is completely harnessed, the legs and neck being secured with strong ropes, two tame elephants, trained for the purpose, are brought to the gate, and placed on either side of it. These immediately eye their captive, feel its mouth in order to ascertain if it has any tusks, or of what proportions, and seize it by the trunk, as a means of calculating the degree of resistance it is likely to offer. Ropes are now passed through the collar of the wild elephant, and made fast to similar collars on each of the tame ones. The bars of the gate are then suddenly drawn out, and the captive instantly attempts to rush forward between its two guards, but it can only advance a short distance, as the cords which secure its hind-legs, still continue fastened to the strong stakes of the toil. In this situation it remains, until the Mahoots, mounted on the two conductors, have drawn tight the cords that bind the wild elephant to their necks. During this operation, the captive frequently endeavours to unfasten, with its trunk, the knots made in the cords that secure it, and attempts to strike the men who are actively engaged in confirming its captivity. But the two domestic elephants never fail to interfere between their riders and their prisoner; and if the latter continue refractory, they batter the unhappy creature with their heads, until they produce the most perfect submission. The nooses of the rope are then loosened, leaving the hind-legs free, and the captive entirely disengaged from the snare. The two tame guardians then press close on each side of their charge, and proceed to the stall designed for its reception, where they deliver it over to its appointed keeper, who submits it to another kind of initiatory discipline.

After the capture, when an elephant is not very unruly, it is customary to place it lengthways between two trees, about forty feet apart, then to strap its hind-legs close together, and fasten them to one of the trees, with five or six turns of thick rope. One of the fore-legs is likewise bound, to which greater liberty is allowed by the length and slackness of the cordage. The pair of tame elephants are then disengaged from the wild one, and led back to the snare, to take charge of another prisoner. When the wild elephant is left alone, its impatience returns, and it makes the most desperate efforts to release itself. While soothed by the society of its kindred guides, it commonly stands perfectly tranquil, appearing to forget its sorrows, and to acquire fortitude under its sufferings: but the moment its companions quit its side, finding itself in bonds, with scarcely power to move, it is agitated to a frightful degree, breaks out into a most appalling roar, and in the furious excitement of its grief, often falls a sacrifice to the exertions which it makes to regain its liberty. Cocoa-nut leaves, and young plantain trees, are offered to it in vain. It tosses them contemptuously aside, or tramples them with indignation under its feet. Generally, however, this paroxysm soon subsides, and the cravings of appetite induce it at length to eat, which it does at first with evident reluctance, but gradually becomes more resigned, and feeds eagerly, at the expiration of a few hours.

When an elephant is of very large size, and apparently, unusually fierce and stubborn, it is led to a stall previously erected for the purpose. Four strong stakes are driven into the ground, at short intervals, parallel with two large trees, the former being traversed by three horizontal bars of great strength, uniting them together. These are strengthened by a second line of stakes, similarly joined, and the whole is secured with strong ropes. The wild elephant is induced to place its head between the two middle stakes, when it is secured above and below by two of the cross-bars. A tame elephant is placed on each side of the captive. On their backs are five or six natives, actively employed in fastening its neck to the stakes, and as many more are engaged in tying the legs, and coiling the ropes round the large trees. All this while, the prisoner is so caressed by the tame elephants, that it is insensible to what is going on. Both the fore and hind-legs are bound together. Five ropes are carried from the latter, one to each of the four corners of the stall, and one is suspended from the cross-beam behind. The fore-legs are secured to the two stakes, between which the tame elephants stand, and two extra ropes extend from those stakes, to the larger trees in the same line. Sometimes this rack is formed merely of hewn timber, but the assistance of living trees is always taken where it can be obtained, as it contributes greatly to the strength of the imprisonment. Secure and strong as this fabric always is, yet many huge elephants shake it to the very foundation, causing the trees to quiver from their summits to their roots, and combine such tremendous bellowings with their exertions, that spectators, unaccustomed to the sight, are apt to entertain the most alarming apprehensions.

The plaintive cries of the elephant, when first made captive, have all the various expressions of sorrow, rage, resentment, and despair. Frequently, after it is bound to the trees, or confined within the stall set apart for its reception, finding every effort to disengage itself ineffectual, its small hollow eyes fill with tears, and its countenance assumes an expression of the deepest melancholy. The females, from natural causes, feel the oppression of the yoke with keener sensibility than the males, and more frequently fall a sacrifice in their protracted struggles for freedom.

It sometimes, though rarely, happens that the captive elephant falls down in the narrow passage of the snare, and when this is the case, it occasions the greatest perplexity; for it is extremely difficult to induce the huge creature to rise. Even fire has been kindled round its body to no purpose. It stubbornly abides the fiery trial, and, in the sullen determination of its despair, dies upon the very spot on which it had fallen. It is difficult to extricate a dead elephant from the narrow passage; the enormous weight almost precluding the possibility of removal, and when such an accident occurs, the only method is to dismember the gigantic body, and draw it out piecemeal. The time necessary to tame elephants, after they are thus captured, is from eight to sixty days*.

KNOX'S ACCOUNT OF THE ELEPHANT.

Knox's account of the elephant, in his *History of Ceylon*, is extremely interesting. "As the elephant is the greatest in body, so is he in understanding also. For he does any thing that his keeper bids him, which it is possible for a beast, not having hands, to do. And as the Chingalays report, they bear the greatest love to their young of all irrational creatures, for the shea are alike tender of any one's young as of their own. Where there are many she elephants together, the young ones go and suck of any as well as of their mothers; and if a young one be in distress, and should cry out, they all in general run to the help and aid thereof. And if they be going over a river, as here be some somewhat broad, and the stream run very swift, they all with their trunks assist and help to convey the young ones over. They take great delight in lying and tumbling in the water, and swim excellently well. Their teeth they never shed. Neither will they ever breed tame ones with tame ones; but the people, to ease themselves of the trouble of bringing them meat, tie their two fore-feet together, and put them into the woods, where, meeting with the wild ones, they conceive, and go one year with young†.

* See CORDIER's *History of Ceylon*.

† This is a mistake, their time of gestation is eighteen months.

"It is their constant practice to shove down with their heads great trees, which they love to eat, when they are too high and they cannot otherwise reach the boughs. Wild ones run much faster than a man, but tame ones not so. The people stand in fear of them, and oftentimes are killed by them. They do them, also, great damage in their grounds, coming by night into their fields, eating up their corn, and likewise their cocoa-nut trees. So that in towns, near unto the woods, where there is plenty of them, the people are forced to watch their corn all night, and also their outyards and plantations, into which being once entered, with eating and trampling, they do much harm before they can be got out. When, by lighting of torches and hallooing, they will not go out, they take their bows and shoot them, but not without some hazard, for sometimes the elephant runs upon them and kills them; for fear of which they will not adventure, unless there be trees, about which they may dodge to defend themselves.

"The king makes use of elephants for executioners. They run their tusks through the body, then tear it in pieces, and throw it limb from limb. Sharp irons, with a socket and three edges, are put on their tusks at such times; for the elephants that are kept have all the ends of their tusks cut, to make them grow the better, and they do grow out again. At some uncertain seasons, an infirmity comes on the males, which go stark mad, so that none can rule them. Many times they run raging with their keepers on their backs, until they throw them down and kill them; but commonly there is notice of it before, by an oil that runs out of their cheeks, which, when it appears, they immediately chain them fast by the legs to great trees. For this infirmity they use no medicine, neither is the animal sick; but the females are never subject to it.

"The keepers of the king's elephants sometimes make sport with them after this manner. They command an elephant to take up water, which he does, and stands with it in his trunk, till they command him to squirt it out at somebody, which he immediately does, it may be a whole painful together, and with such force, that a man can hardly stand against it." J. H. C.

‡ This is likewise a mistake. I have known a tame elephant go fourteen miles in one hour.

READER! you have been bred in a land abounding with men, able in arts, learning and knowledges manifold; this man in one, this in another, few in many, none in all. But there is one art of which every man should be a master, the art of *reflection*. If you are not a *thinking* man, to what purpose are you a *man* at all. In like manner, there is one knowledge, which it is every man's duty and interest to acquire, namely, *self-knowledge*. Or to what end was man alone, of all animals, endued by the Creator with the faculty of *self-consciousness*?—COLERIDGE.

It behoves us always to bear in mind, that while *actions* are always to be judged by the immutable standard of right and wrong, the judgments which we pass upon *men* must be qualified by considerations of age, country, situation, and other accidental circumstances, and it will then be found that he who is most charitable in his judgment, is generally the least unjust.—SOUTHEY.

THOSE, who in the confidence of superior capacities or attainments neglect the common maxims of life, should be reminded that nothing will supply the want of prudence; but that negligence and irregularity, long continued, will make knowledge useless, wit ridiculous, and genius contemptible.—JOHNSON.

KNOWLEDGE and wisdom, far from being one, Have oftentimes no connexion. Knowledge dwells In heads replete with thoughts of other men, Wisdom in minds attentive to their own; Knowledge, a rude unprofitable mass, The mere materials with which Wisdom builds, Till smooth'd, and squared, and fitted into place, Does but encumber what it seems to enrich. Knowledge is proud that he has learned so much, Wisdom is humble that he knows no more.—COWPER.

THE LAC INSECT, (*Chermes lacca*.)

THE little insect represented in the engraving, is found upon several trees and shrubs in the East Indies; it produces the substance called *Lac*, which is of considerable use in various arts and manufactures. The best account we have of this useful little creature, is that given by Dr. Roxburgh, in the *Transactions of the Philosophical Society*.

"Some pieces of very fresh-looking lac, adhering to small branches of *Mimosa cinerea*, were brought to me from the mountains. I kept them carefully in wide-mouthed bottles slightly covered, and fourteen days from the time they came from the hills, thousands of exceedingly minute red animals were observed crawling about the lac and the branches it adhered to, and still more were issuing from small holes on the surface of the cells. By the assistance of glasses, small excrescences were also observed, interspersed among these holes, two regularly to each hole, crowned with some very fine white hairs, which being wiped off, two white spots appeared, (see fig. 1.)

"The animals, when single, ran about pretty briskly, but in general, on opening the cells, they were so numerous, as to be crowded over one another. The substance of which the cells were formed cannot be better described, with respect to appearance, than by saying it is like the transparent amber of which beads are made. The external covering of the cells is about the twenty-fourth part of an inch in thickness, it is remarkably strong, and able to resist injuries; the partitions are much thinner. The cells are, in general, irregular squares, pentagons and hexagons, about an eighth of an inch in diameter, and a quarter of an inch deep; they have no communication with each other. All those opened during the time the animals were issuing from them, contained in one side, which occupied half the cell, a small bag filled with a thick jelly-like red liquor, replete with what I take to be eggs. These bags adhere to the bottom of the cells, and have each two necks, (see fig. 3,) which pass through holes in the outward coat of the cells, forming the excrescences we have mentioned, ending in some fine white hairs. The other half of the cells have a distinct opening, and contain a white substance, like a few filaments of cotton rolled together, and a number of the little red insects themselves, crawling about, ready to make their exit. Their portion of each cell is about one half, and I think must have contained nearly one hundred of these animals. In other cells less forward, I found a thick, red, dark, blood-coloured liquor, with numbers of exceedingly minute eggs, many times smaller than those found in the small bags which occupied the other half of the cells."

These animals undergo several changes in the course of their existence, from the egg proceeds the larva (fig. 8,) its next change is into the pupa (fig. 9,) from which, at length, the perfect insect issues* (figs. 5 and 11.)

As an article of commerce, lac is known in Europe under the names of *stick-lac*, *seed-lac*, and *shell-lac*. The first is the lac in its native state, as it is found adhering to the twigs on which it was originally deposited. The seed-lac is the yellowish hard resinous powder, which remains after the red colour of stick-lac has been extracted, as far as it can conveniently be done, by water. Shell-lac is produced from seed-lac, by putting the latter into long cylindrical bags of cotton cloth, melting it by holding the bags over a charcoal fire: and when the lac melts, straining it through the cloth by twisting the bags. The lac thus strained is allowed to fall upon

the smooth plank of a plantain-tree, and in this form it is brought to Europe, and is employed in the manufacture of sealing-wax and varnishes. It forms the basis of the well-known French polish, and is used by hatters in the making of waterproof hats.

The colouring matter which the stick-lac contains, is employed in dyeing; and the deeper the colour of the sample, the better it is for that purpose. The colour which it affords, is less brilliant than the scarlet obtained from cochineal; but it has the advantage of possessing greater durability. It is said, that it may be employed to good purpose, by mixing a certain quantity with the cochineal, when, if it is not in too large a proportion, the scarlet will be rendered more permanent, without losing any thing of its beauty. The lac-colour is preserved by the natives, upon flakes of cotton-wool dipped repeatedly into a strong solution of the lac-insect in water, and then dried.

Dr. Bancroft endeavoured, by certain processes, to improve the brilliancy of the colouring-matter of the lac, and he so far succeeded, as to dye several small pieces of cloth of a brilliant scarlet, equal to that produced by cochineal; but when the experiment was tried on a larger scale, from some ill-understood cause, it was unsuccessful.

We cannot well conclude this account, without noticing a very singular use made of this substance, in India; namely, the forming it into grindstones, by the following plan.—"Take of river-sand three parts, of seed-lac washed one part, mix them over a fire, and form the mass into the shape of a grindstone, having a square hole in the centre; cement it to an axis with melted lac, heat the stone moderately; and while revolving rapidly on its axis, it can be easily formed into a circle."

Polishing grindstones are only made of such sand as will pass easily through fine muslin, in the proportion of two parts sand to one of lac. Some persons, instead of sand, use the powder of a very hard kind of granite. These grindstones cut very fast. The same composition is formed upon sticks for cutting stones, shells, &c., by the hand.

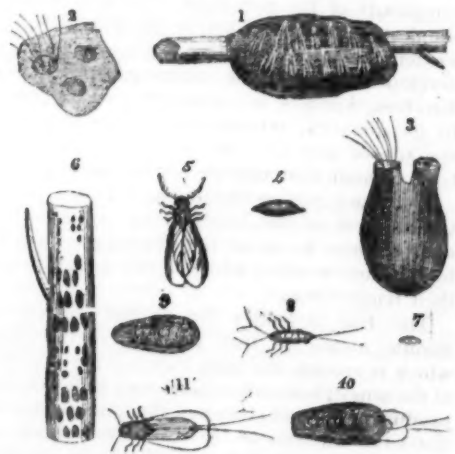


Fig.

REFERENCES TO THE ENGRAVING.

1. Stick-lac on a branch of the *Mimosa cinerea*. Natural size.
2. Outside of the top of a cell with its three openings.
3. The little bag containing a male fly.
4. The egg of a male fly.
5. Male fly in a perfect state.
6. Piece of a branch with insects in the larva state. Natural size
7. Egg of female.
8. Larva of ditto.
9. Pupa of ditto.
10. The perfect insect escaping from the pupa.
11. Perfect female fly.

} Much magnified

} Much magnified.

* See *Saturday Magazine*, Vol. II., p. 212.

ON THE MORAL AND PHYSICAL CONDITION OF MAN.

I.

It is essential to the development of the energies of that intellectual principle which is within us, that an intercourse be established between it and the material existences without.

The immaterial and undying soul is, in this, our present state, so wrought around and entrammelled by its material appendages, as to be incapable of any availing exercise of its powers, until they have first been schooled and disciplined by that intercourse. Without it, reason there could be *none*, where there would be no *data*; memory none, where nothing had been perceived; imagination none, where there was no reality. Man, endued with all the attributes of humanity, could possess none of its energies. His form might combine all the elements of power and beauty: the blood of life might flow through it; the soul might hold in it her accustomed seat; and the senses, her ministers, might be disposed around, ready to do her bidding; but were there no external objects whereon to occupy those senses, or were the sentient principle careless or unable to avail herself of their ministry, the whole would present the emblem of a death-like repose, of a perpetual and dreamless sleep.

For the carrying on of this intercourse, man is provided, in the organs of sense, with means of boundless application, and of most exquisite contrivance.

The Hand, for instance, is capable of moving accurately to any point, of varying the quantity and direction of its motion and pressure in every conceivable way, and, by habit, it may be made to measure, and to take note of this power and direction with inconceivable minuteness. The manual skill acquired by painters, sculptors, and operative mechanics, is no other than the application of a knowledge of the effects of different, and of exceedingly minute, developments of force, accurately measured, both as to their quantity and direction, in the mechanism of the hand, and treasured, with these results, in the memory. It is beyond the power of imagination to conceive the variety and complexity of its operations. Writing is one of the simplest of them, and yet, in the formation of every written character, there takes place a certain minute development of force, varying in quantity and direction, which is accurately poised in the hand as to its quantity, measured as to its direction, and remembered, and may be re-formed again, the same, even without the assistance of the sight.

The hand serves further as a probe, to measure the degrees of the hardness or softness of bodies, and the smoothness of their surfaces; as a balance, to compare weight; as a thermometer, to estimate their temperature.

The Ear estimates for us the motions of the minute atoms of that form of matter (the air,) which is among the most subtle; regular vibrations of the atmosphere, when made with different velocities, producing distinct sounds. And, similarly, the Eye notes the motions of the still more minute particles of light, indicating their different relations in the varieties of colour.

How exquisite must be the mechanism which enables us thus to measure the force of impulses of whose existence the lightest body we can conceive, however delicately suspended, will, when opposed to them, give no perceptible evidence; impulses of atoms so minute, as to be incomparably less than the smallest portion of matter, whose distinct existence we have ever been able to recognise.

Exquisitely wrought as are the senses of hearing and sight, who will assert that any superfluous contrivance has been bestowed on their construction?

Were it not for the perfect sympathy thus established between our organs of sensation, and those subtle fluids of air and light, which pervade the space in which we exist, all that we see, having distinctness and firm, and all that we hear of modulated sound, would have been lost to us. There might, with less of contrivance in the eye, have been the perception of light, but there could have been none of those exquisite varieties of shade and colour, which enable us to appreciate the objects we look upon; and so, with a less-delicate mechanism of the ear, there might have been hearing, but all distinction of the rapid and evanescent varieties in articulate sound, would have been impossible, and there could have been no perception of measured harmony.

Not only has man the means for carrying on the intercourse thus essential to all that constitutes his active existence, but he is irresistibly impelled to the use of those means, and to the establishment of that intercourse; for, the circumstances in which man is placed, impel him, of necessity, to acquire the knowledge which he has thus the means of acquiring.

He is so constituted as never to be capable of deriving entire satisfaction from any thing which he may obtain. Not only is he gifted with senses enabling him to distinguish the minutest differences of external things, but each of the perceptions which he thus obtains is coupled with an emotion equally delicate and varied, of pleasure or pain. Thus exquisitely sensitive, he finds himself urged perpetually by wants which nothing in the world he inhabits offers *itself* to gratify, liable to calamities which nothing, of itself, intervenes to screen him from; and he is never without the hope of some enjoyment, or the terror of some suffering.

This apparent destitution of man is the great element of his intellectual and physical superiority; inasmuch as it forces him to the acquisition of that KNOWLEDGE in which he finds the secret of supplying his wants.

Nature has so ministered to the comforts of inferior animals, as to limit the wants they are themselves called upon to supply, to a definite and an exceedingly small number; and limited as these wants, are their means of perceiving the qualities of the external things which are necessary for their gratification.

Man is a creature of boundless desires and wants, and he is thus intellectually and physically great, because his desires and his wants are thus boundless.

Urged on in a perpetual round of new sensations, every one of which is more or less permanently registered by the memory, and rendered an element of knowledge; he may be called emphatically, as distinguished from all others, a *learning animal*.

Had he possessed no other distinctive qualification than that of organs infinitely better suited than those of any other class of animals, to convey to his mind distinct perceptions of the material world in all its modifications, coupled with equally acute emotions of pleasure and pain, together with unlimited desires for the enjoyment of the one, and for exemption from the other; and, thus constituted, had he been placed as we find him in a world where nothing was supplied to his hand, for the gratification of these desires; where every desire and every suffering pointed to the KNOWLEDGE of some class of material existences, through which that desire might be satisfied, or that pain avoided; were there no higher attributes of humanity than these, it is scarcely pos-

sible to affix a limit to the superiority which might, even with these aids, be acquired by it in the scale of existence.

Here, then, is evidence of wisdom and goodness even in the *wants* and the *sufferings* which have been allotted to man, eminently calculated to reconcile him to the discomforts which it has pleased heaven to place around him,—the restlessness of those desires which are implanted in his bosom, and his *apparent* destitution in creation—elements, as these are, of that which constitutes his pre-eminence.

With power almost creative over the material existences around him—with knowledge, the secret of applying that power—with senses, admirably adapted for acquiring that knowledge—and with necessities, impelling him to its acquisition—let us combine the godlike faculty of *REASON*, a principle of life to the whole, and we behold in man a being created for dominion in this lower world. "Thou, O God, hast made him a little lower than the angels, and hast crowned him with glory and honour. Thou madest him to have dominion over the works of thy hands."

Thus furnished for combating with the physical evils around him, how complete is his triumph over them! He piles up for himself a dwelling, in which, surrounded by an artificial heat, he endures the storm, and may, if he chooses, scarcely be sensible of the variety of the seasons. One animal he strips of its coat for his covering, the life of another is sacrificed for his food, and a third bears his limbs in luxurious ease. The earth no longer produces the variety of her own spontaneous fruits, but yields her increase more abundantly under the exercise of his skill. Her natural boundaries impose no restraint upon him, the inequalities of her surface vanish from his path, and he harnesses the winds to his chariot and traverses her seas. No distance removes her stores beyond his reach. Within the boundaries of civilization it is to be doubted whether there be any individual so destitute or so wretched, that the four quarters of the globe do not daily minister to his necessities or his comfort.

When, in obtaining for himself the objects of his desires, his own strength fails him, he seizes upon the forces inherent in matter, and brings them, in all their stupendous energy, to co-operate with his feebleness.

He can accumulate the weight or attraction of inanimate matter to any extent, and direct its combined operation to any point; that power, as existing in fluid matter, he can cause to transfer itself any where, disseminate itself through any space, and exert itself in producing effects, however minute, or however powerful; in sweeping away the smallest particle of dust, or causing to revolve a vast complication of machinery.

He holds in equal mastery that force of repulsion which also pervades matter as universally as attraction, and which we call heat. He can unloose it from the mineral substances amidst whose atoms it lies bound. He can infuse it into others whose parts are held together by forces inconceivably greater than any we can appreciate; he can overcome those forces, and separate those parts. He can cause it to insinuate itself, for instance, within the pores of the diamond, scatter the cohesive power which constitutes it the hardest of material bodies, and dissolve it in air. In its combination with fluids, in the form of steam, he can accumulate and concentrate this repulsion to any extent, and cause it to transfer itself to any point where it may suit him to avail himself of its energies.

No less complete is his control in the application of these powers when acquired. By the intervention of machinery he can vary their quantity and direction in any way. Concentrate them so as to cause forces, acting through ever so large a space, to exert themselves through ever so small a one, with energies greater as that space is less. He can again dilute these in any degree, so as to cause them to exert a feebler influence over a larger space. The same quantity of power which, with infinite lightness, but inconceivable rapidity, fines the point of a needle, may thus, under another form, be made slowly to lift the hammer of a forge. To carry on the analogy of a fluid, he can pour this *force* from one body to another, accumulate successive influxes, and then throw their united energy wherever he chooses to avail himself of it. How wonderfully is it seen acting in the different parts of a manufactory, moving, as it were, through huge channels along its centre, thence diffused in smaller veins to its extremities, and yielding there to each workman a fountain of power proportioned to his wants!

[MOSELEY on *Mechanics applied to the Arts*.]

MAN is, for the most part, equally unhappy, when subjected, without redress, to the passions of another, or left, without control, to the dominion of his own. This, every man, however unwilling he may be to own it of himself, will very readily acknowledge of his neighbour. No man knows any one except himself, whom he judges fit to be set free from the coercion of laws, and to be abandoned entirely to his own choice. By this consideration, have all civilized nations been induced to the enactment of penal laws; laws by which every man's danger becomes every man's safety, and by which, though all are restrained, yet all are benefited.—JOHNSON.

HE that takes his full liberty in what he may, shall repent him: how much more in what he should not? I never read of Christian that repented him of too little worldly delight. The surest course I have still found in all earthly pleasures, to rise with an appetite, and to be satisfied with a little.—BISHOP HALL.

THEY, who once engage in iniquitous designs, miserably deceive themselves, when they think that they will go so far, and no further; one fault begets another, one crime renders another necessary; and thus they are impelled continually downward into a depth of guilt, which, at the commencement of their career, they would have died rather than have incurred.—SOUTHBY.

THE MINES OF GREAT BRITAIN.

VI. SURFACE WORKS OF MINES.

OUR preceding articles on the subject of Mining, will have conveyed to the reader a tolerably accurate idea of the nature of mineral veins, which, in most countries, form the chief depositories of the metallic ores. They have also traced the progress of those subterranean operations, which the ingenuity of man has devised for discovering these hidden stores, and availing himself of their contents.

Any account of the various and complicated machinery and apparatus made use of in these operations, or of the processes employed, would far exceed our limits; we may, however, glance at a few of the difficulties to be surmounted in their progress.

The rock to be penetrated is sometimes so hard, as immediately to turn the edge of every tool employed against it; at others so soft, as immediately to crush in upon the miner, unless his excavations are closely followed by the strongest timbering. The air he breathes is sometimes so impure, as scarcely to allow a candle to burn or to support respiration,

and when a second communication with the atmosphere cannot be obtained, it is only by various ingenious contrivances that this evil can be remedied. Even when ventilation is established, the temperature in which the miner carries on his laborious occupation, is equal to, and in some cases greater, than what is felt at the surface during the hottest summer's day. A perpendicular descent by ladders, sometimes amounting to 1500 or 1600 feet, conveys the miner to his work; and the still more fatiguing ascent from that depth, is required to bring him to the light of day when his labour is ended; while, in either case, inevitable and frightful death would follow from a faltering step, or a slip from a careless hold.

As the workings of the mine proceed in depth and extent, the water of the surrounding country filters through the rock in such a quantity, that were it not for the continual action of enormous columns of pumps, worked by very powerful steam-engines, the mine would be immediately inundated.

Even when these and many other difficulties have been surmounted, at vast expense, by skill and perseverance, it sometimes happens that the hopes of the miner are disappointed, the irregularity of nature, in the disposition of her mineral treasures, being in some cases such as to deceive the best founded expectations of success.

Let us now, however, turn to the surface of the mine, and trace the changes which will have taken place there during the progress of the underground works described in the preceding papers; for although these operations are themselves unseen, their effects are extremely apparent. We suppose, of course, that the mine is found to be productive, as otherwise the undertaking would early have been brought to a close.

The situation of mines is generally dreary in the extreme, often the summit or declivity of a barren hill or mountain; for nature, with a wise economy, usually places her mineral treasures in spots almost unsusceptible of cultivation, and where, therefore, the breaking up of the surface, and strewing it with the accumulated fragments of rock brought from below, can do no damage to vegetation, nor impede the pursuits of agriculture.

The working of the mine will not have proceeded very long, before the influx of water renders it necessary to make an effectual provision for the drainage. For this purpose, if circumstances will admit, large overshot water-wheels are erected, but if not, one or more steam-engines, and, in course of time, very frequently both are employed. The ore and rubbish which is to be raised from the mine, requires also considerable power to be provided for its extraction, and this is generally furnished by the horse-machines termed *whims*, but in very rich mines by steam-engines.

As the quantity of ore produced increases, one or more pieces of ground on the surface are appropriated to its reception, with suitable erections and apparatus, for the performance of the various mechanical operations which it has to undergo, previous to passing into the hands of the smelter, who, by chemical processes in the furnace, reduces it to the metallic state.

The increased traffic to the mine, will, by this time, have occasioned roads to be made, where, perhaps, before, scarcely a path existed, and the rivulets which had before run to waste, will have been conducted by artificial channels to the mine, and employed there in giving motion to machinery and other purposes. Nor will the comforts and convenience of those engaged in these operations have been neglected.

A suitable building will early have been erected as an office, for transacting the business of the mine, and also as a temporary residence for the superintendents, whose duties require them alternately to be on the spot by day and by night. Ranges of buildings for the accommodation of the miners will also have been erected, containing separate sheds for each, in which their tools, powder, and underground clothes are kept, and where also they change themselves when going into the mine. Thus the formerly barren and neglected spot becomes covered with buildings and machinery, and presents a scene of bustle and activity, of which description can hardly convey an adequate idea.

The effects of this new source of employment are not, however, by any means, confined to the surface of the mine itself. Numerous cottages for the miners will have sprung up within the distance of a mile or two around it, and however sterile the soil, it will at length be subdued by patient and persevering industry, and formed into spots of garden-ground surrounding them. The neighbouring town or village will also increase in size and importance, proportionally with the advancing prosperity of the mine. Not unfrequently when the nearest village is remote, one will arise near the mine itself, to receive the population concentrated around it, more especially if, as is often the case, the success of the first undertaking, should occasion others of a similar kind near it, and thus render the population of a permanent character. Such, indeed, has been the origin, at periods more or less remote, of most of the towns and villages scattered over many of the mining districts, both of this and other countries, and which, but for their mineral treasures, would still have remained almost uninhabited. In proof of this, we may give a striking illustration from the works of the celebrated traveller Humboldt, speaking of one of the great mines of Mexico, he observes, "when the Count de la Valenciana (then M. Obregon,) began to work the vein of Guanaxuato, above the valley of San Xavier, goats were feeding on the very hill, which, ten years afterwards, was covered with a town containing seven or eight thousand inhabitants."

Having thus traced the progress of a mine from its first simple excavations, briefly noticing the works on the surface connected with it, and the wide spread influence of these operations, we may observe, that the village church, with its "heaven directed spire," will not unfrequently form a new and pleasing feature in the scene we have been contemplating.

F. B.

A FAIR IN HINDOOSTAN.

It is not an easy matter to describe the singular scene that is exhibited at the fair of Hurdwar, where the Hindoos assemble in countless multitudes, to combine, as they every where contrive so admirably to do, their spiritual and temporal pursuits.

For several miles before we reached it, we had passed thousands of people in every description of vehicle, hastening towards it. They were of all ages, all costumes, and all complexions; no spot upon earth can produce so great a variety of the human race at one assemblage, and it would be impossible to enumerate the articles of different sorts, or even the countries that produce them, offered for sale in the streets. The merchants, in their own language, praise their own commodities, and make a confusion of tongues highly bewildering to a learned pundit, but to an European "confusion worse confounded."

There are horses from all parts of the globe, elephants, camels, and buffaloes, cows and sheep of every denomination, thickly crowded together; dogs, cats, and monkeys, leopards, bears, and cheaters; sometimes the cubs of a tigress, and always from the elk to the mouse-deer, every species of that animal. Shawls from Cashmere, and woollen-cloths from England, are displayed on the same stall; coral from the Red Sea, agate from the Guzzarat, precious stones from Ceylon, gums and spices from Arabia, assafetida and rose-water from Persia, brought by each country to the mart, lie by the side of watches from France, pickles from China, sauces from England, and perfumes from Bond Street and the Rue St. Honoré. I have seen a case of French rouge, and henna for the fingers of an eastern fair, selling in adjoining booths; antimony to give a languor to an oriental eye, and all the embellishments of an European toilet.

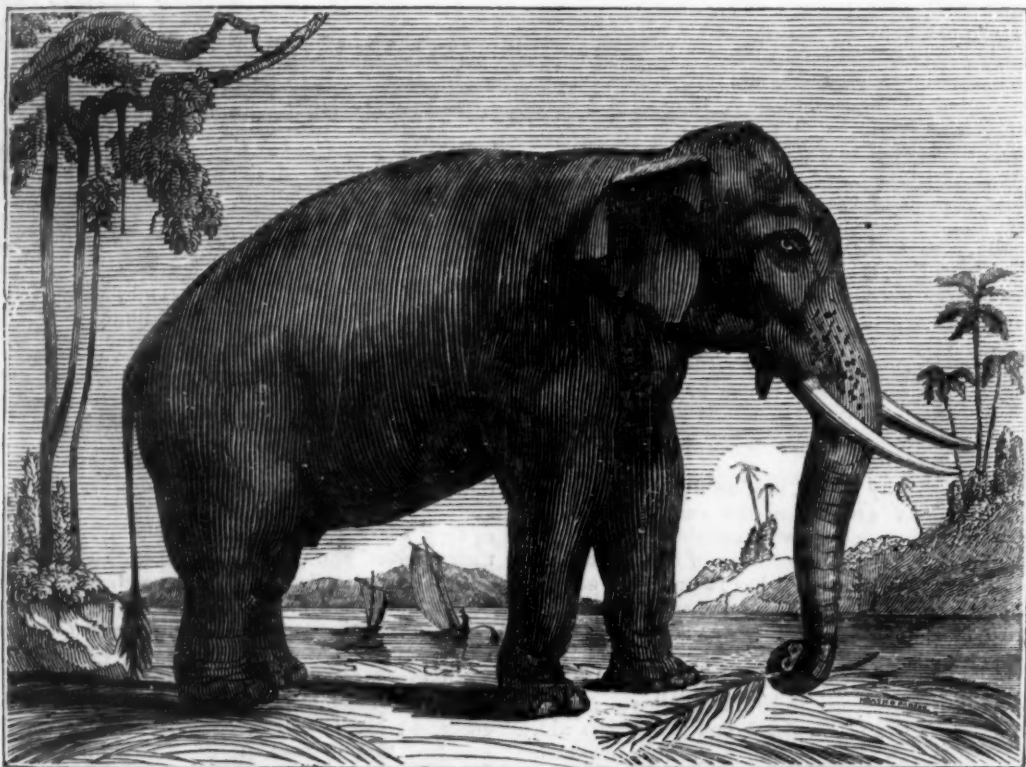
In roaming through the fair, you are amused by the tricks of the eastern jockeys: here one is ambling on a richly-caparisoned horse, with necklaces of beads, and bangles of silver, displaying his paces with the utmost dexterity; another is galloping as hard as he can, to show how admirably he can bring him on his haunches; while a third lets his horse loose, and calls him by a whistle, to prove his docility. Elephants and camels are exhibiting at the same time their several graces and accomplishments; while a Persian, with a brood of the beautiful cats of his country, stands quietly by to attract you with his quadrupeds, if you should fail in making a bargain for the larger ones.

The dealers invariably ask ten times as much as they mean to take, and vary their demands as they

gather from your countenance your anxiety or indifference for the purchase. It is not uncommon for a horse-dealer to fall, in the course of a few moments, in his demand, from ten to one thousand rupees. When the bargain is about to be concluded, the buyer and the seller throw a cloth over their hands, and, naming a price, ascertain by the pressure of certain joints how nearly they are making towards its termination. By this means, in the midst of a crowd, they deal in secret; and it is laughable to see through an affected air of carelessness, how deeply they are interested.

During their great attention to worldly matters, they are not forgetful of the grand object of the Hurdwar meeting: crowds succeeding crowds move all day towards the Ghaut, and no minute of the twenty-four hours passes without being marked by the rites of the worship of the Ganges; the devout bathers of both sexes assemble in thousands, and perform their ablutions with so perfect a sincerity and indifference to appearance, that they seem nearly ignorant whether they are clad or not. The Ghaut presents as singular and motley a sight as the fair itself: Europeans lounging on the backs of elephants to witness the bathing—Brahmins busy in collecting the tribute—religious mendicants displaying every species of indecency and distortion—and Christian ministers anxiously and industriously distributing to the pilgrims copies of the Scriptures translated into their various languages. Some of these excellent men—for no difficulty or labour stays them in their heavenward course—sit in the porches of the temples, with baskets of tracts by their sides, giving them to all who approach.

[SKINNER'S *Excursions in India.*]



THE CEYLON ELEPHANT. A PORTRAIT, FROM A SKETCH BY W. DANIELL, ESQ.